



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,176	08/30/2006	Atsushi Sano	129277	7454
25944 7590 09/04/2009 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER TURNER, KATHERINE ANN				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
09/04/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/591,176

Applicant(s)

SANO ET AL.

Examiner

Katherine Turner

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 9-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-8, 15 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment filed May 26, 2009 has been entered. Claims 1-15 and 17 are pending. Claim 7 is amended. Claims 1-6 and 9-14 are withdrawn. Claim 16 is cancelled.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on March 4, 2009.

Election/Restrictions

3. Applicant marked claims 1-6 and 9-14 as withdrawn without traverse in the reply filed on May 26, 2009. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

4. The claim rejections under 35 U.S.C. 102(b) as anticipated by Scott et al. (WO 2004/021486) on claims 7 and 17 are withdrawn, because the independent claim 7 has been amended.

Claim Rejections - 35 USC § 103

5. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Scott et al. (WO 2004/021486) in view of Mao et al. (US 6,238,534) on claim 8 is withdrawn, because the independent claim 7 has been amended.

6. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Scott et al. (WO 2004/021486) in view of Mao et al. (US 6,238,534) and Fleischer et al. (US 2002/0127474) on claim 15 is withdrawn, because the independent claim 7 has been amended.

7. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Scott et al. (WO 2004/021486) in view of Mao et al. (US 6,238,534), Fleischer et al. (US 2002/0127474), and Uchida et al. (JP2004134132 please see JPO IPDL machine translation for citation) on claim 16 is withdrawn, because claim 16 has been cancelled.

8. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al. (WO 2004/021486) in view of Uchida et al. (JP2004134132 please see JPO IPDL machine translation for citation).

Regarding claim 7, Scott et al. discloses a direct alcohol fuel cell, with methanol or ethanol as the fuel, comprising an anode outer layer (32) of oxidation electrocatalyst, a cathode catalyst layer (12), and a membrane (6), preferably a polymer membrane, arranged between the anode and the cathode, the direct alcohol fuel cell generating

electricity by supplying the anode with aqueous methanol solution; wherein the electrolyte is an anion exchange membrane; and the electrocatalyst for the reduction of oxidant at the cathode may be silver (Ag) (figure 2; page 2, lines 16-25; page 10, lines 13-25; page 18, lines 4-8; page 20, lines 1-9; page 21, lines 18-19; page 24, lines 14-25; page 25, lines 1-25; page 29, lines 1-6; page 30, lines 22-25; page 32, lines 1-15), but is silent as to the cathode catalyst layer (12) containing an anion exchange resin as a binder.

Uchida et al. teaches an air pole (cathode) of a fuel cell with ion exchange resin being used as a binder for the electrode, because the inside of the electrode catalyst layer may all act as a reaction field (paragraph 19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an ion exchange resin as a binder for the cathode catalyst layer, because Uchida et al. teaches that the inside of the electrode catalyst layer may all act as a reaction field when ion exchange resin is used as a binder (paragraph 19).

Scott et al. discloses an anion exchange membrane made of anion exchange polymers providing selective transport of negatively charged ions (figure 2; page 20, lines 1-25; page 21, lines 1-22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize an anionic exchange resin as the binder for the cathode catalyst layer, because Scott et al. discloses anion exchange polymers provide selective transport of negatively charged ions (page 20, lines 1-25; page 21, lines 1-22).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al. (WO 2004/021486) in view of Uchida et al. (JP2004134132 please see JPO IPDL machine translation for citation) as applied to claims 7 and 17 above, and further in view of Mao et al. (US 6,238,534).

Scott et al. discloses a cathode catalyst layer (12) and the electrocatalyst for the reduction of oxidant at the cathode may be silver (Ag) (figure 2; page 18, lines 4-8; page 29, lines 1-6; page 30, lines 22-25), but is silent as to the cathode catalyst layer (12) containing a carrier catalyst having a carbon material carrying the silver.

Mao et al. teaches a cathode layer for a MEA in a fuel cell comprising catalyst supported on carbon particles, because the carbon particles provide mechanical support and necessary electrical conductivity within the electrode layer (column 5, lines 38-50). It would have been obvious to one of ordinary skill in the art at the time the invention was made to support the silver catalyst on carbon particles in the cathode catalyst layer, because Mao et al. teaches the carbon particles provide mechanical support and necessary electrical conductivity within the electrode layer when a catalyst is supported on carbon particles in a cathode (column 5, lines 38-50).

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scott et al. (WO 2004/021486) in view of Uchida et al. (JP2004134132 please see JPO IPDL machine translation for citation) and Mao et al. (US 6,238,534) as applied to claims 7, 8, and 17 above, and further in view of Fleischer et al. (US 2002/0127474).

Scott et al. discloses an anion exchange membrane as an electrolyte may be solid, preferably a polymer membrane (page 20, lines 1-25; page 21, lines 1-22), but is silent as to the anion exchange membrane being constituted by a polymer compound having a cation group within a molecule.

Fleischer et al. teaches anion exchange membranes based on quaternary ammoniums, with alkyl chains, (Applicant's polymer compound having a cation group within a molecule) being used in methanol fuel cells, because the anion exchange membranes appear to be good candidates for limiting fuel crossover in methanol fuel cells (paragraph 17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an anion exchange membrane based on quaternary ammoniums, with alkyl chains (Applicant's polymer compound having a cation group within a molecule), because Fleischer et al. teaches the anion exchange membranes, such as those based on quaternary ammoniums, with alkyl chains, (Applicant's polymer compound having a cation group within a molecule) appear to be good candidates for limiting fuel crossover in methanol fuel cells (paragraph 17).

Response to Arguments

11. Applicant's arguments filed May 26, 2009 have been fully considered but they are not persuasive.

12. *Applicant's principal arguments are:*

(a) *Scott et al. does not disclose the criticality of this combination of features, specifically the anion exchange resin with the silver in the cathode to reduce the corrosion of the silver.*

(b) *Scott et al. teaches that the catalyst is chosen dependent on the fuel used, and that one of ordinary skill would not chose silver.*

In response to Applicant's arguments, please consider the following comments.

(a) Scott et al. in view of Uchida et al. teaches the cathode catalyst layer containing silver and anion exchange resin as binder, because Uchida et al. teaches that the inside of the electrode catalyst layer may all act as a reaction field when ion exchange resin is used as a binder (paragraph 19), and Scott et al. discloses anion exchange polymers provide selective transport of negatively charged ions (page 20, lines 1-25; page 21, lines 1-22).

However, mere recognition of latent properties, such as corrosion of silver being reduced, in the prior art does not render nonobvious an otherwise known invention. *In re Wiseman*, 596 F.2d 1019, 201 USPQ 658 (CCPA 1979). "The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious." *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). See MPEP 2415 (II).

The applicant has yet to provide any factual evidence in support of the criticality of the cathode catalyst layer containing anion exchange resin as a binder

when silver is the catalyst. The arguments of counsel cannot take place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). See MPEP 2145 (I). Also, Applicant is reminded that objective evidence, which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, or solution of a long-felt need. See MPEP 716.01 and 716.02.

(b) Scott et al. discloses that the catalyst is chosen dependent on the nature of the fuel and oxidant, as the nature of the fuel and oxidant dictates the catalytic activity (page 17, lines 13-17), and Scott et al. discloses that at the cathode for an oxidant, for example oxygen, the electrocatalyst may be silver (page 18, lines 4-7), thus not teaching that the cathode would require a special electrocatalyst for methanol or ethanol as Applicant is argues.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Turner whose telephone number is (571)270-5314. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/591,176

Page 10

Art Unit: 1795

/K. T./

Examiner, Art Unit 1795

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795